SPEC® CFP2006 Result

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IBM Corporation

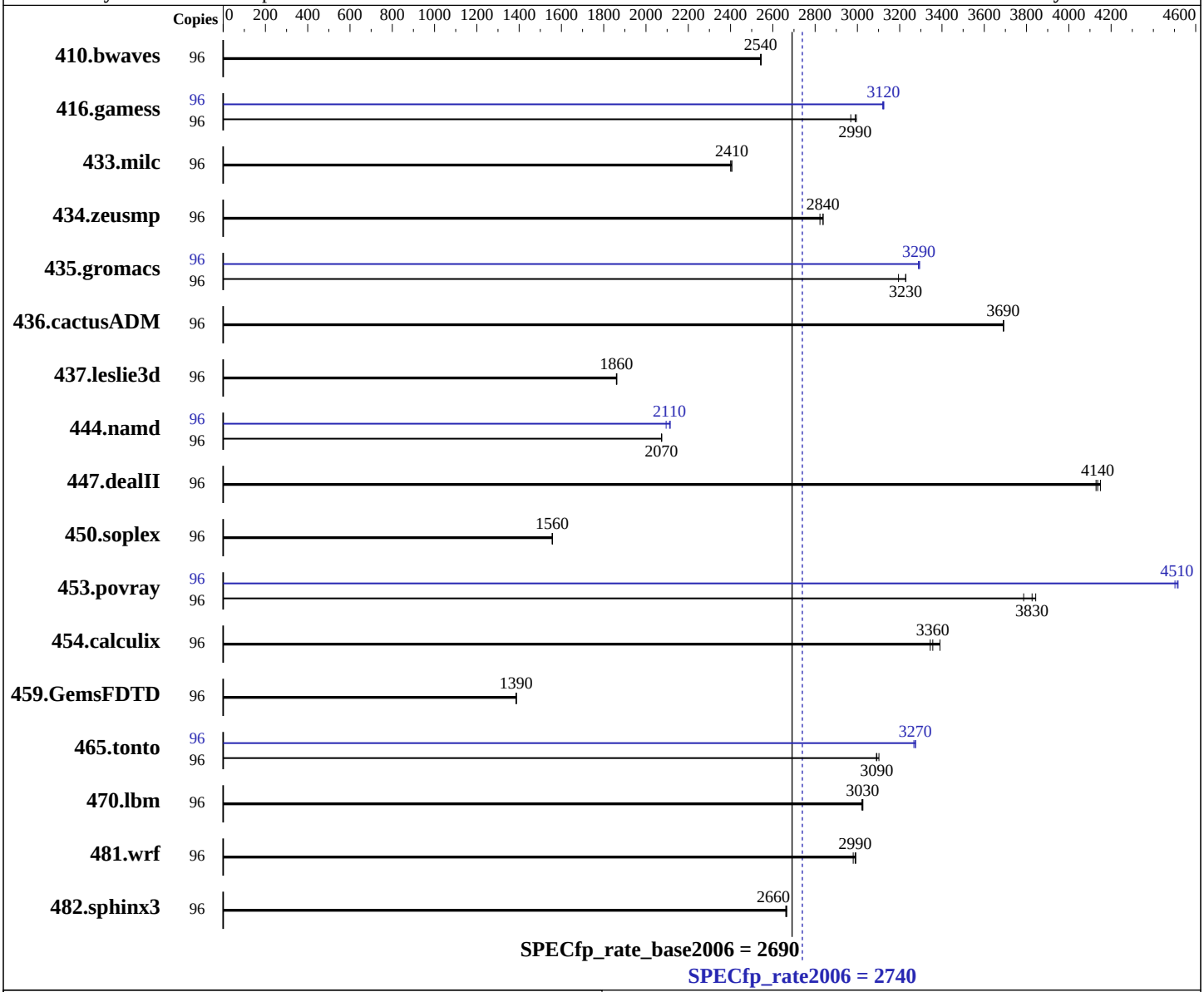
IBM System x3950 X6
(Intel Xeon E7-8857 v2, 3.60 GHz)

SPECfp®_rate2006 = 2740

SPECfp_rate_base2006 = 2690

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Jun-2014
Hardware Availability: Jun-2014
Software Availability: Nov-2013



Hardware

CPU Name:	Intel Xeon E7-8857 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.60 GHz
CPU MHz:	3000
FPU:	Integrated
CPU(s) enabled:	96 cores, 8 chips, 12 cores/chip
CPU(s) orderable:	4,6,8 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core

Continued on next page

Software

Operating System:	Red Hat Enterprise Linux Server release 6.5 (Santiago) 2.6.32-431.el6.x86_64
Compiler:	C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux; Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	ext4

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L3 Cache: 30 MB I+D on chip per chip
Other Cache: None
Memory: 2 TB (128 x 16 GB 2Rx4 PC3L-12800R-11, ECC, running at 1333 MHz)
Disk Subsystem: 1 x 400 GB SATA, SSD
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	96	**513**	**2540**	513	2540	513	2540	96	**513**	**2540**	513	2540	513	2540
416.gamess	96	**629**	**2990**	633	2970	628	3000	96	603	3120	**602**	**3120**	601	3130
433.milc	96	367	2400	**366**	**2410**	366	2410	96	367	2400	**366**	**2410**	366	2410
434.zeusmp	96	308	2840	**308**	**2840**	309	2820	96	308	2840	**308**	**2840**	309	2820
435.gromacs	96	**212**	**3230**	212	3230	215	3190	96	**208**	**3290**	208	3290	208	3290
436.cactusADM	96	**311**	**3690**	311	3690	311	3690	96	**311**	**3690**	311	3690	311	3690
437.leslie3d	96	**485**	**1860**	485	1860	485	1860	96	**485**	**1860**	485	1860	485	1860
444.namd	96	371	2070	**371**	**2070**	371	2070	96	367	2100	364	2110	**365**	**2110**
447.dealII	96	265	4150	266	4130	**266**	**4140**	96	265	4150	266	4130	**266**	**4140**
450.soplex	96	514	1560	**514**	**1560**	514	1560	96	514	1560	**514**	**1560**	514	1560
453.povray	96	133	3840	135	3790	**133**	**3830**	96	113	4500	**113**	**4510**	113	4520
454.calculix	96	**236**	**3360**	234	3390	237	3340	96	**236**	**3360**	234	3390	237	3340
459.GemsFDTD	96	736	1380	734	1390	**735**	**1390**	96	736	1380	734	1390	**735**	**1390**
465.tonto	96	306	3090	305	3100	**306**	**3090**	96	289	3270	288	3280	**289**	**3270**
470.lbm	96	436	3030	437	3020	**436**	**3030**	96	436	3030	437	3020	**436**	**3030**
481.wrf	96	358	2990	**359**	**2990**	360	2980	96	358	2990	**359**	**2990**	360	2980
482.sphinx3	96	703	2660	**703**	**2660**	702	2670	96	703	2660	**703**	**2660**	702	2670

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

Platform Notes

```
Operating Mode set to Maximum Perfomance in BIOS
Memory Data Scrambling Disabled
Patrol Scrub Disabled
Sysinfo program /cpu2006.1.2_14_aug2013/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on x3950x6 Thu Jun 12 03:19:16 2014

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) CPU E7-8857 v2 @ 3.00GHz
      8 "physical id"s (chips)
      96 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
   caution.)
      cpu cores : 12
      siblings  : 12
      physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 4: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 5: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 6: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 7: cores 0 1 2 3 4 5 8 9 10 11 12 13
   cache size : 30720 KB

From /proc/meminfo
   MemTotal:       2117464504 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.5 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux x3950x6 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54 EST 2013
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jun 11 15:56

SPEC is set to: /cpu2006.1.2_14_aug2013
   Filesystem                Type  Size  Used Avail Use% Mounted on
   /dev/mapper/vg_x3950x6-lv_root ext4  357G  8.6G  330G   3% /
```

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Platform Notes (Continued)

```
 Additional information from dmidecode:
   BIOS IBM -[A8E107JUS-1.00]- 05/02/2014
   Memory:
    64x Hynix HMT42GR7AFR4A-PB 16 GB 1333 MHz 2 rank
    64x NO DIMM Unknown
    64x Samsung M393B2G70QH0-YK0 16 GB 1333 MHz 2 rank

 (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/cpu2006.1.2_14_aug2013/libs/32:/cpu2006.1.2_14_aug2013/libs/64:/cpu2006.1.2_14_aug2013/sh"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
 Filesystem page cache cleared with:
 echo 1>       /proc/sys/vm/drop_caches
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

Base Compiler Invocation

C benchmarks:
```
icc   -m64
```

C++ benchmarks:
```
icpc  -m64
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc   -m64 ifort -m64
```

Base Portability Flags

```
    410.bwaves: -DSPEC_CPU_LP64
    416.gamess: -DSPEC_CPU_LP64
      433.milc: -DSPEC_CPU_LP64
    434.zeusmp: -DSPEC_CPU_LP64
   435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
```

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Base Portability Flags (Continued)

437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

C++ benchmarks:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

Fortran benchmarks:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch

Benchmarks using both Fortran and C:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

Peak Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
icc -m64 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2 -inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: basepeak = yes

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -opt-prefetch -auto-ilp32

Continued on next page

Peak Optimization Flags (Continued)

436.cactusADM: `basepeak = yes`

454.calculix: `basepeak = yes`

481.wrf: `basepeak = yes`

The flags files that were used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html`
`http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml`
`http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.xml`

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For other inquiries, please contact webmaster@spec.org.

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